

Last chance for 15 million electric vehicles by 2030

How a rapid transformation to electromobility can still succeed in Germany and why the involvement of Chinese car manufacturers plays an important role

STUDY

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The German government aims to put at least 15 million battery electric vehicles (BEVs) on the road by 2030. The 2021–25 coalition agreement signed by the SPD, Greens, and FDP identifies this target as an important means of achieving climate goals in the transport sector while also preserving domestic jobs and manufacturing.¹ The current BEV expansion target represents a considerable increase in ambition over the government's former goal of having 1 million electric vehicles on the road by 2020.² The research is clear: BEVs emit significantly fewer greenhouse gases over their life cycle than diesel or petrol combustion engine vehicles.³ Furthermore, the emissions advantage enjoyed by BEVs increases in line with the share of renewables in the electricity mix. The broad-based adoption of electric vehicles is considered the most effective means of reducing emissions in the transport sector up to the end of this decade.⁴

Nevertheless, electric vehicles remain few and far between on German roads. Among the 49 million cars in Germany's national fleet, less than 1.5 million are BEVs (as of 1 April 2024).⁵ With just over six years until the end of 2030, the 15 million BEV target would thus seem nearly utopian in its ambition, as fulfilling this target will require the registration of 1.7 million new BEVs each year. In other words, more than half of new vehicle registrations (which totalled 2.8 million in 2023) would need to be BEVs in the coming years.⁶

A six million vehicle gap

If current policy and market conditions remain unchanged, there will not be 15 million BEVs on the road in 2030, but just under 9 million, according to model calculations carried out by Boston Consulting Group (BCG) on behalf of Agora Verkehrswende. This means that Germany will fall short of achieving its 15 million BEV target by some 6 million vehicles.⁷ Beyond pushing the 2030 emissions target for the transport sector into the distant future, this would jeopardize the long-term goal of making all sectors of the Germany economy climate neutral by 2045. What is more, it could significantly upset the unavoidable structural transformation of the automotive industry. By extension, the goal of making Germany a "lead market for electric vehicles" – as set forth in the Coalition Agreement – could slip out of reach. This would have corresponding negative effects on domestic employment.

However, abandoning or modifying the 2030 target is not a viable option, even given slackening BEV adoption rates. For one, there is a lack of alternative strategies for achieving emission reduction targets in the transport sector. At the same time, one cannot expect outsized

¹ https://www.spd.de/fileadmin/Dokumente/Koalitionsvertrag/Koalitionsvertrag_2021-2025.pdf

² This goal was initially announced in 2010 and later enshrined in the 2013–17 Coalition Agreement. The 2018 Coalition Agreement merely stated that the aim was to "significantly advance" electric mobility

³ https://www.umweltbundesamt.de/sites/default/files/medien/11850/publikationen/13_2024_texte_analysis_of_the_environmental_balance_of_vehicles_0.pdf

⁴ "Electric vehicles are the key technology to decarbonise road transport," the IEA affirms; see <https://www.iea.org/energy-system/transport/electric-vehicles>

⁵ Federal Motor Transport Authority, vehicle fleet statistics:

https://www.kba.de/DE/Statistik/Fahrzeuge/Bestand/Vierteljaehrlicher_Bestand/vierteljaehrlicher_bestand_node.html

⁶ <https://www.adac.de/news/e-monitoring/>

⁷ The underlying calculations will be presented in detail in a separate publication. For more on our results, please visit: <https://www.agora-verkehrswende.de/veroeffentlichungen/>

contributions from other sectors (i.e. energy, industry, buildings, agriculture) that would offset reduction shortfalls in transport.

Accordingly, policymakers have an obligation to take action that assures transport will achieve (or come close to achieving) the 15 million BEV adoption target. According to analysis conducted by BCG and Agora Verkehrswende, meeting this target will require a combination of mutually reinforcing policy instruments. An astute policy mix can ensure minimum support costs for the rapid expansion of e-mobility.

The crucial importance of the right policy mix

Achieving the 15 million BEV target will require a combination of consumer incentives, regulatory quotas, infrastructure expansion measures, and wise trade policy. In various cases, the policy measures necessary in this regard have already been implemented elsewhere in Europe. Model calculations performed by BCG and Agora Verkehrswende provide insight into the relative contribution that each instrument can make to closing the 6 million BEV gap.

- **Economic incentives:** The present system of vehicle taxes does not adequately reflect the divergent climate and environmental impacts of BEVs and ICEs. This puts e-mobility at an unfair competitive disadvantage.⁸ As a result, the goal should be to ensure that BEVs have a lower the total cost of ownership (TCO) than comparable ICEs. This can be achieved with a combination of mutually reinforcing measures, including CO₂ levies on ICEs; the modification of company car taxation rules; reforms to vehicle and energy taxes; purchase rebates and tax breaks for electric vehicles; and reduced electricity prices at charging stations. The government outlays required to reduce the TCO of electric vehicles can be at least partially defrayed by additional revenues from increased taxes on new vehicles with high emissions. Based on the calculations for a representative scenario, such incentives could put 1.1 million additional private BEVs on the road by 2030.
- **Regulatory requirements:** More than two-thirds of all new passenger cars in Germany are registered by companies. However, only just over eleven per cent of newly registered vehicles were BEVs in the period from January to June 2024. This figure is well below the BEV share in new vehicle registrations by households (15.1 per cent).⁹ Accordingly, it is crucial to tap the latent potential offered by the market for company cars. BEV purchase quotas for vehicle manufacturers and commercial fleet operators represent a promising option in this regard. The quotas that are enacted should be designed to continually increase in a predictable manner. Government can prevent serious disadvantages for manufacturers and fleet operators by offering compensation to offset additional costs. Incrementally higher minimum quotas for commercial fleets could put 3.1 million additional BEVs on the road by 2030.

⁸ Although annual vehicle taxes are already partially based on CO₂ emissions, survey shows that consumers hardly take this tax into account when making a purchase decision, as the associated costs are distributed over many years and are not particularly high. See: https://www.agora-verkehrswende.de/fileadmin/Projekte/2022/Kfz-u-Dienstwagen/84_Gesamt-Kfz-und-Dienstwagenbesteuerung.pdf

⁹ https://www.kba.de/DE/Statistik/Fahrzeuge/Neuzulassungen/Umwelt/n_umwelt_node.html

- Charging infrastructure: At the beginning of 2024, there were some 98,000 publicly accessible regular charging points and 25,000 fast charging points in Germany.¹⁰ While these numbers may seem large at first glance, charging infrastructure coverage clearly remains inadequate, as many consumers cite insufficient charging infrastructure and associated waiting times as a major obstacle to electric vehicle purchase. According to the model calculations, the accelerated expansion of public and private charging infrastructure – such that supply exceeds demand by 20% – has the potential to increase cumulative demand for BEVs by around 300,000 units up to 2030. Accordingly, immediate action should be taken to honour the Coalition Agreement’s pledge to accelerate the early expansion of charging infrastructure in a manner that anticipates future needs. Model calculations performed by BCG and Agora Verkehrswende indicate that “accelerated expansion” would necessitate the installation of some 13.2 million charging points by 2030. This would require the installation of more charging stations each year than in the past seven years combined – and would mean a ten-fold increase in the total stock of charging stations by 2030.
- Market competition: The success of the effort to boost consumer demand for BEVs and thus achieve higher market penetration rates will depend in part of the availability of smaller and cheaper electric vehicle models.¹¹ Such models are mainly offered by Chinese manufacturers – they are only available in Germany at significant price mark-ups, yet are still reasonably priced. Chinese manufacturers had a BEV market share of just 6% in Germany in 2023. Expanding the Chinese presence in the German market has the potential to increase the number of BEVs on the road by 1.5 million units up to 2030. In such a case, Chinese manufacturers would have a market share of approximately 15%.

The relevance of Chinese carmakers for the 15 million BEV target

The BCG and Agora Verkehrswende study does not consider whether Chinese manufacturers are receiving anti-competitive subsidies. However, it does estimate the consequences that would result were the EU to increase import duties from 10% to 47.6%. Such protective measures would make Chinese BEVs more expensive, thus significantly curbing demand. If the tariff regime that has been imposed on a provisional basis enters into force as planned for five years beginning in November 2024,¹² the BEV fleet in Germany will be 1.3–2.4 million vehicles smaller in 2030. The imposition of high tariffs on Chinese EVs will have deleterious effects: While some Chinese manufacturers are likely to refrain from entering the European market due to increased hurdles and risks, those that do will be unable to offer low prices. This, in turn, will reduce market competition, leading to higher price levels overall.

¹⁰ <https://www.bundesnetzagentur.de/DE/Fachthemen/ElektrizitaetundGas/E-Mobilitaet/start.html>

¹¹ See also <https://www.iea.org/reports/global-ev-outlook-2024/trends-in-electric-cars>: “An equitable and inclusive transition to electric mobility, both within countries and at the global level, hinges on the successful launch of affordable EVs.”

¹² The tariffs do not need to be paid until the new regime enters into force; customs authorities are currently only requesting bank guarantees. See: https://germany.representation.ec.europa.eu/news/eu-kommission-fuehrt-vorlaufige-ausgleichszolle-auf-batteriebetriebene-elektrofahrzeuge-aus-china-2024-07-04_de

However, higher duties on Chinese imports would not only undermine the goal of putting 15 million BEVs on the road by 2030. They would also endanger the German automotive industry, which generates 35% of its revenues in China, and which is reliant on Chinese parts and raw materials to manufacture BEVs.¹³ In addition, the German automotive industry would be particularly affected by retaliatory measures that China could take in response to Europe's enactment of import duties.

The transformation of the German automotive industry is inexorable – and it will invariably have impacts on domestic employment. Even if the net impacts are largely positive, there will be both winners and losers. The value added by German manufacturers and part suppliers is lower for BEVs than ICEs; this shift in value creation endangers domestic jobs. According to model calculations performed by BCG and Agora Verkehrswende, if the 15 million BEV target is achieved, some 60,000 jobs at vehicle manufacturers and part suppliers will become redundant by 2030, thus leading to employment in the core automotive industry to fall by 8%. In a business as usual (BAU) scenario, which assumes a 6 million BEV shortfall in 2030, some 30,000 jobs will be lost. Yet this apparent advantage to the BAU scenario is actually no advantage at all, for a slower adoption trend in Germany would mean a less competitive domestic EV industry, which would bring the risk of even more severe job losses at a later date.

Protecting jobs by accelerating structural change

While accelerated structural change that aims to close the 6 million BEV gap will have negative employment effects due to shifts in value added chains, it will also unleash knock-on effects that are positive for job growth. According to an earlier study by Agora Verkehrswende and BCG, the production, installation, and operation of charging infrastructure will create some 70,000 jobs by 2030. In addition, some 25,000 new jobs will be created by higher demand for renewable electricity.¹⁴ Alongside these positive employment effects in energy sector, additional workers will be needed for increased vehicle and battery production. A faster transformation means a lower likelihood of a net loss in jobs.

This is all the more true if Chinese market actors establish manufacturing sites in Germany as part of an accelerated trend towards EV adoption. Chinese manufacturers could be encouraged to take such a step given reliable sales growth in the German market. The adoption of Local Content Requirements (LCRs) – that is, rules that a company must derive a certain amount of the final value of a good or service from domestic firms – could help to accelerate such foreign direct investment. The localization of Chinese BEV production in the European Union could increase the share of German value added from 1% to 16%; by contrast, if Chinese manufacturers were to produce in Germany, the share of German value added could rise to 35%. Moreover, cooperation with Chinese companies in the field of batteries offers the opportunity to catch up in terms of development or to collaboratively advance innovation. In recent years, German development has been lagging, particularly in the battery value chain.

¹³ Chinese companies currently control 60% of the raw materials required for BEV manufacture.

¹⁴ See the study *Autojobs unter Strom*, also produced by BCG and Agora Verkehrswende: https://www.agora-verkehrswende.de/fileadmin/Projekte/2021/BCG-Jobstudie/64_Jobeffekte.pdf

The speed with which Chinese manufacturers establish a stronger presence in the German market will influence not only the likelihood of achieving the 15 million BEV target but also associated costs. This is because Chinese manufacturers are a particularly important source of low-cost vehicle models. A greater availability of low-cost Chinese vehicles will mean lower government support costs for the expansion of the national BEV fleet.

The benefits of transformation

Depending on BEV model availability and associated consumer demand, we estimate the costs of the accelerated ramp up at between 45 and 65 billion euros up to 2030. This cost estimate includes expenditures for the construction and operation of charging infrastructure; compensation granted to vehicle manufacturers and commercial fleet operators to meet BEV quotas; and consumer purchase incentives. How these costs are distributed between the public sector, consumers, and manufacturers will depend on the policy instruments that are selected and their specific design. If Chinese manufacturers are prevented from expanding their presence in the German market, higher costs will result. This is a particularly relevant consideration given current budgetary challenges.

However, it would be myopic to focus solely on the costs that will accrue up to 2030. For if these expenditures were avoided altogether, higher costs would eventually result, even if they are difficult to quantify at present. For one, a failure to meet internationally binding climate protection targets is likely to incur penalties and sanctions over the medium term. Furthermore, over a longer timeframe, we can expect significant job losses, in part due to an inability to compete in the areas of battery production and charging infrastructure. Last but not least, a failure to transform will mean higher costs from pollution and climate change. These factors, in turn, will result in falling tax revenues.

Conversely, rapid BEV adoption would generate numerous benefits. Beyond the achievement of climate targets, Germany companies would be in a position to benefit from the globally expanding market for BEVs. Accelerating BEV penetration rates in partnership with Chinese manufacturers could also represent part of a de-risking strategy in relation to China. For clearly, impeding Chinese access to the European market would allow Chinese manufacturers to expand their competitive edge in the area of electric vehicles – to the detriment of both Germany and Europe. Legislators would be wise to heed this insight with an effective policy response.